

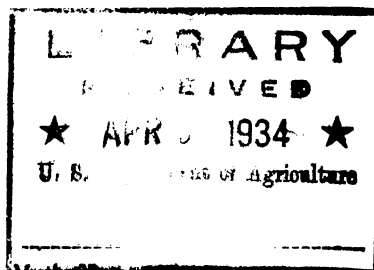
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THE EXTENSION ANIMAL HUSBANDMAN

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C. D. Lowe, Senior Extension Animal Husbandman,
K. F. Warner, Animal Husbandman in Meat Extension.

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ARTIFICIAL INSEMINATION

By Hugh C. McPhee, Senior Animal Husbandman,
Bureau of Animal Industry.

The extensive use of artificial insemination by the scientists of Soviet Russia in their large scale animal-breeding operations has been responsible for several publications on the subject during the last four years. Most of these are printed in the Russian language and hence are readily available to only a limited number of persons in America. Fortunately, reviews of the more important reports have been made available in two articles in the English language. One of these is a 5 1/2-page discussion of the Russian method by Dr. Walter Landauer and published in the March 1933 issue of the Journal of Heredity. The other is a publication of 56 pages entitled, "The Technique of Artificial Insemination," prepared in the Imperial Bureau of Animal Genetics in Edinburgh, Scotland, and published by Oliver and Boyd. The latter is probably the most detailed treatise on the subject published in our language. It is for the purpose of making available in a brief form the essential points brought out in these publications that this report has been prepared.

There are really five essential phases to the successful practice of artificial insemination; (1) assembling the necessary instruments; (2) preparation of solutions for dilution; (3) obtaining the semen; (4) microscopic examination and (5) injection of the diluted sperm suspensions into the female.

The essential instruments are a vaginal speculum, glass tubes for carrying the solutions to be used in diluting the semen, a glass syringe, nickel-plated pincers, a sperm collector, and a catheter. Only nickel-plated or glass instruments should be used because some other metals have a toxic effect upon spermatozoa. All instruments should be carefully washed and then sterilized in 65 percent alcohol. The removal of the alcohol is accomplished by use of a sterile salt solution. When working with bulls the solution used consists of 0.5 gram sodium bicarbonate (NaHCO_3) and 10 grams chemically pure sodium chloride in 1 liter of distilled water. When breeding sheep the amount of sodium chloride is increased to 11 grams. It should always be kept in mind that water alone is toxic to spermatozoa and should be carefully avoided.

Sperm can be obtained by one of several methods such as inserting a sponge treated with physiological salt solution into the

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vagina of the female before mating, by removal of the sperm from the anterior end of the vagina after a normal mating, by use of a sperm collector or by the use of an artificial vagina. Of these methods, the withdrawal directly from the vagina and the use of the sperm collector seem to be the most extensively used although the use of the artificial vagina is apparently increasing. The sperm collector is essentially a tube of thin rubber closed at one end and expanded at the open end by a metal ring. Another ring is located some distance from this ring and serves to keep the apparatus in position and to provide for expansion and contraction. The actual dimensions of the tube vary in the different species. Before using, the tube should be carefully washed and sterilized and then the inner surfaces smeared with sterile white vaseline. After the service has been made the fluids are removed immediately to sterile glass tubes and covered with a thin layer of vaseline oil. The same principles are involved in the artificial vagina method except that here the flexible rubber tube is enclosed in a hard rubber tube through which water is passed to maintain the desired temperature. This apparatus is then either quickly inserted between the male and the female just before service is to be made or is placed in an artificial specimen constructed to resemble the female. In the latter case it is usually necessary to use some sort of stimulation in order to get the male to copulate. Frequently this is done by having a live female present.

It has been found that dilution with an isotonic glucose phosphate not only maintains but actually increases the viability of the spermatozoa. Dilutions are made to the extent of 10 to 30 times the original volume of the semen. The simplest and most recently developed solutions for this purpose appear to be those given by Milovanov and are follows:

Composition of solutions (grams per liter of water)						
Animal	Na_2SO_4	Anhydrous glucose	Salt-free peptone	Na_2HPO_4 $12\text{H}_2\text{O}$	K KH_2PO_4	Calcium lactate
Cattle	13.6	12.0	5.0
Sheep	...	50.4	...	6.78	0.15	1.91
Horse	3.40	57.6	2.0

The hydrogen-ion concentration of the mixture should be from 7.3 to 7.5. During subsequent handling the sperm suspensions should be kept at a constant temperature. Violent agitation should be avoided and bacterial contamination excluded. Apparently the optimum temperature

is 50 degrees F. with an allowable maximum range of 5 degrees F. either side of this. Such a temperature can be easily maintained in the laboratory by any one of several constant temperature devices but for shipment of material an especially insulated box is required.

In order to insure success, microscopic examination should be made before any of the material is used for insemination. The most satisfactory magnification appears to be about 200 to 300 times. The sperm suspension should contain very large numbers of active spermatozoa and be free from foreign particles of any kind. Spermatozoa showing low activity or the presence among them of abnormalities should not be used for insemination.

The general procedure for the injection of the spermatozoa is about as follows: The female (in heat) should be placed in a stall where she cannot move about. A special stall which can be revolved and tilted adds greatly to the convenience when sheep are being worked upon. After the female has been placed in the stall a speculum is placed in to the vagina, the glass syringe is filled with sperm, the catheter is introduced in to the cervix (not over 3 cm. for the cow and 1 cm. for the ewe) and the required amount of fluid is injected. Before starting on another female the catheter should be wiped on the outside with a cloth dipped in alcohol and dried with a sterile cloth. The speculum should be washed and disinfected. Of course, when changing from the sperm of one male to that of another all instruments should be carefully washed and sterilized inside and out.

It should be remembered that the methods briefly outlined above are ones which have been developed particularly for conditions which prevail in Russia where phenomenal success has been obtained by using large numbers of females which are under unit control. Improved methods and carefully planned organization have resulted in a steady increase of efficiency until at present it is perfectly feasible to inseminate as many as 4,000 ewes with the sperm of a single ram during the breeding season of 40 days' duration.

In America where conditions are quite different it is likely that the use of artificial insemination will be confined largely to special situations such as very large breeding establishments or locations where desirable males cannot be conveniently had for service. This will necessitate the development of facilities not only for the collection and injection of the necessary fluids but also for their storage and transportation. We now have available methods which are efficient and satisfactory but the speed with which an organization for their application is developed will depend primarily upon the need for such methods in our systems of agriculture.

SOME RESULTS OF PASTURE INVESTIGATIONS

By A. T. Sample, Associate Animal Husbandman,
Animal Husbandry Division, Bureau of Animal Industry.

In keeping with the urgent need for establishing pastures on some forty million acres or more of land now being tilled in the United States, to adjust the production of livestock products to present world trade conditions, and to reduce the wastage of top soil through erosion, the U. S. Department of Agriculture is conducting investigations in the utilization of pastures in 16 States. Nearly all this work is in cooperation with the State experiment stations of the States in which the work is done.

According to the "Report of the Chief of Bureau of Animal Industry, 1933", some of the principal results of these investigations are as follows:

At the U. S. Animal Husbandry Experiment Farm, Beltsville, Md., on good soil, grazing one yearling steer per acre on mixed pasture has given consistently greater returns per acre than allowing 2 acres per steer for an average grazing period of approximately 168 days. Under the same conditions continuous grazing at the rate of one steer per acre has given slightly greater gains per acre than rotation grazing with the same area per steer divided in two pastures. Similar results are being obtained at Sni-a-Bar Farms, Grain Valley, Mo., in a comparison of continuous grazing with rotation grazing, using 3 instead of 2 areas in rotation. The heavy continuous grazing at Beltsville has been found most favorable to establishment of bluegrass and white clover.

At the same station, a mixture of wheat and rye as winter pasture for sheep is considerably better than either wheat or rye alone, according to the first year's test.

In creep feeding calves on pasture at Sni-a-Bar Farms, Grain Valley, Mo., the use of shelled corn has given better results than ground corn. The addition of molasses to corn and cottonseed meal increased the feed consumption but not the rate of gain.

At the Coastal Plain station, McNeill, Miss., 10 years' records show that winter burned cutover long-leaf pine land produced one-third more gain on beef cattle than unburned land. The burning favored the growth of legumes and resulted in forage

containing 30 percent more protein and 13 percent more mineral matter than in the same grasses on unburned areas.

At Miles City, Mont., the efficiency of wintering beef cows on the range with 1 to 2 pounds of cottonseed cake for 1 to 2 months has been demonstrated. At Ardmore, S. Dak., satisfactory results have been obtained in wintering yearling steers on native pastures reserved for winter use with similarly small quantities of supplemental feed.

At Dubois, Idaho, it has been found that the number of lambs born per 100 ewes bred and the weight and length of staple of fleeces vary directly with the abundance of rainfall, which is the dominating factor in the growth of range.

In swine-production experiments at Ardmore, S. Dak., and Jeanerette, La., very positive benefits from the use of pastures as compared to dry-lot feeding are shown.

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SUMMARY OF MISSOURI MEETINGS

(Subject-matter meetings held by specialists in 1933)

Kind	Meetings				Total	
	General		Results and Methods Dem.		No.	Attendance
	No.	Attendance	No.	Attendance		
Hog-sanitation and Feeding	63	3,760	7	1,089	70	4,849
Beef-cattle feeding and herd demonstration	71	4,490	8	1,225	79	5,715
Sheep improvement	61	3,460	43	3,603	104	7,063
Horses	48	2,917	44	2,938	92	5,855
4-H club			11	7,716	11	7,716
Wheat	33	1,265			33	1,265
Totals	276	15,892	113	16,571	389	32,463

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W.T.

GROWING-THRIFTY PIGS IN INDIANA

By J. W. Schwab, Associate in Animal Husbandry Extension,
Purdue University

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The object of swine extension work in Indiana is to improve the swine industry to its highest degree of economic efficiency. This is being accomplished by the close cooperative effort of the Purdue University Swine Extension Division and the county agricultural agents with farmers growing five or more litters of pigs which are raised for market. It is called the Thrifty Pig Project and is organized on a county basis.

The first major activity in the project is a hog school generally of two days' duration. These schools are held late in December and in January and February. The program usually consists of four phases on management, feeding, and equipment; two phases on pig troubles and their prevention; and two on information which farmers should know about markets and the marketing of hogs.

The information on feeding and management is a combination of swine experimental data and the best farm practices collected from several hundred farmers who have been growing pigs successfully in the project during the last seven years. The program on pig troubles and their prevention requires the assistance of an experienced veterinarian. Three unthrifty pigs farrowed in September or October are obtained from three different herds for post-mortem demonstrations to ascertain the abnormal conditions inside of the pig. This is done on a table in front of each hog school audience. More than 350 unthrifty pigs have been "posted" during the last eight winters in the heavy corn and hog growing sections of the State. These post-mortem demonstrations have revealed that 87 percent of these pigs were infested with the intestinal roundworm. Thorn-headed, whip, and lung worms were found in 13.7, 53.7 and 51.7 percent respectively of such pigs. Also, 82.3 percent of these pigs had impaired or damaged lungs. These dissection demonstrations nearly always deliver a "knock out blow" relative to the necessity of practicing the pig-trouble-prevention plan.

The program on marketing is given by a specialist in marketing from the University Extension Service. The hog outlook for the current year and the various phases of marketing hogs as applied to Indiana farmers are fully discussed.

During the hog schools, six to eight farmers raising hogs for market and preferably those having had unthrifty herds of pigs in the past year, are obtained as cooperators to demonstrate the Hoosier plan of growing thrifty pigs on their farms. Special information is always given by circular letters to these farmers through the county agricultural agent's office. The swine extension specialist and the county agent call on these men at the close of the spring farrowing season and again at weaning time. Additional information as applied to the various herds may be given in person on these visits. Farrowing, feeding, management, and equipment records are secured from each herd on prepared cards which are convenient for filing.

During August and September, result demonstration meetings are held at two or three successful herds in a county. Everybody interested in farming is invited to these meetings. The principal speaker at a meeting is the farmer who raised the herd. The county agent has the organization of the meeting in charge and the extension specialist supplements the remarks of the farmer. These field meetings, held at herds of thrifty pigs where unthrifty ones previously grew, clinch the practicality of the project and the people in attendance will spread the information.

A check on the results of the project reveals that farmers once starting the thrifty-pig way continue to use it and in a short time his neighbors are using the plan too.

A cooperator in Wabash County raised and marketed 82 spring pigs from 10 sows. These pigs averaged 205 pounds each at the market when they were five months and 17 days old.

Another cooperator in Madison County raised 66 pigs from seven litters. The average weight per litter was 2,150 pounds at 180 days of age. Another cooperator said it helped him to raise the best hogs for market in 15 years. Not all cooperators are successful but we learn as much from them and often many times more than from the successful ones.

The swine extension work is strongly supported by the Ton Litter Club and Herd Production Project which are sponsored by the Indiana Livestock Breeders' Association. The swine extension work in Indiana is also adjusted this year to the corn-hog reduction measures.

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SURVEY ON THE CAUSE OF CANCER EYE IN CATTLE

By Dr. W. L. Black, Extension Animal Husbandman,
State College, New Mexico.

Because of weather conditions in New Mexico, the condition known as cancer eye is much more annoying and the losses from it are heavier than they would be in the northern States. The reason that they are of greater importance is that our warm weather makes the screw-worm problem an ever present one. Any injury or a condition such as a cancer eye, is almost certain to become infested with these parasites. This results in an extremely filthy wound and one which is very noticeable to the ranchmen, so that they think that the incidence of the cancer eye is higher than it actually has been shown to be by data compiled on the subject.

In New Mexico most of the cattle are Herefords and there is seemingly no question that the incidence of the condition is higher in this breed than in any other. A great many theories as to the cause of the condition have been advanced. One theory is that it is produced as an aftereffect of pinkeye, (infectious keratitis). Another is that the condition is caused by the animals grazing on thorny plants which in many cases produce traumatism in the region of the eye. Another theory is that dust may produce sufficient irritation in the eye to result in this condition. Still another is that animals grazing on certain classes of plants may develop a photosensitization. Still another is that animals grazing certain plants may get irritating pollens in their eyes, and there is still another theory that the tendency to this condition is inherited.

Last fall we decided to make a survey in an effort to determine whether or not any of the above-mentioned theories had a basis of fact to substantiate them. Accordingly, we sent out a questionnaire to all the ranchmen of the State. When we attempted to compile the data from the questionnaires which were returned to us we discovered that most of the cattle of breeds other than Hereford were owned by dairymen or were run in small farm herds. We, therefore, decided that as these cattle were carried under entirely different conditions from the range cattle, it would simply confuse the issue to include them in our compilation.

After eliminating these herds we had a total of 256 ranches

and 163,893 Hereford cattle among which 581 cancer eyes had occurred during the year of 1933. These cattle ranged at altitudes of from 3,000 feet to 9,000 feet. In the lower altitudes the weather was much dryer than at the higher altitudes, which resulted in a great deal more dust being in the air. Thorny plants were also much more prevalent at the lower altitudes than at the higher. The character of the vegetation is entirely different in the lower altitudes from that found in the higher.

A summary of the data showed that the incidence of cancer eyes was practically the same at all altitudes. In fact, the highest incidence of the condition that we found was at a altitude of 8,000 to 9,000 feet. We found that 62 percent of the cattle in infected herds were in regions where thorny plants were prevalent. We also found that 62 percent of the cancer eyes occurred in these herds. We found that 62 percent of the cattle in infected herds were in herds where pinkeye had occurred during the year, and that 63 percent of the cancer eyes were in the herds having pinkeye. The total incidence of the condition in the herds was 0.43 of 1 percent during the year.

Summing up of our findings for the one year would indicate the following, although we are not stating it as a definite conclusion because one year's results are not enough to give accurate information:

The prevalence of thorny plants does not affect the number of cancer eyes.

Dust does not affect the number of cancer eyes.

If there is a relation between pollen from plants and the condition, it is evident that a rather wide variety of pollens is involved, because the cattle surveyed cover a great variety of vegetation.

The same thing holds true for photosensitization caused by eating of certain plants, and the results of this survey would indicate that the factor does not play a part.

There is also the fact that at these varying altitudes the actinic rays of the sun vary a great deal in their effect on animals, so we feel that this factor has been largely eliminated.

It was impossible in making this survey to determine whether or not there was an inherited tendency. Some of the ranchmen cited instances where cancers had occurred in two or three generations of the offspring of certain animals. We of course had no way of knowing as to whether or not this was simply a coincidence.

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We feel that while the data we have are extremely insufficient, they are still definite enough that we can say that it is extremely doubtful as to whether any of the factors mentioned above, with the possible exception of the effect of the sun's rays on unpigmented skin around the eyes of Hereford cattle, and the hereditary factor, have any effect whatsoever upon the incidence of this condition. It is our intention to continue this survey over a period of several years, as in that manner we hope to eliminate factors that occurred in years previous to the beginning of the survey, and were, therefore, not listed in making this survey, but which may be found to have had some bearing upon the number of cancer eyes occurring during the past year.

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DATA ON AGRICULTURAL EXTENSION SPECIALISTS

The following information is taken from U.S.D.A. Extension Circular 189 and is based on a questionnaire survey. Authors are T. Roy Reid and M. C. Wilson.

Distribution of Specialist's Time

<u>Activity</u>	<u>Percentage of Time</u>
Conferences	8.2
County visits	40.7
Correspondence	9.9
Circular letters	3.7
Meetings	7.3
Judging	2.3
Radio	2.1
Preparing teaching materials	13.6
Service activities	5.6
Reports	6.6

Location of Offices of Specialists

<u>Location</u>	<u>Percentage</u>
With subject-matter department	51.2
With Extension Service	29.3
Some with subject-matter, some with Extension	19.5

Basis of Division of Work

(Where more than one specialist is employed on a project)

<u>Basis of Division</u>	<u>Percentage of States</u>
Division of State	2.7
Division of subject-matter	29.7
One in charge, others assist	40.6
Combination of above	27.0

DATA ON AGRICULTURAL EXTENSION SPECIALISTS (Continued)

<u>Education and Experience of Specialists</u> <u>at Time of Appointment</u>	
<u>Kind of Training or Experience</u>	<u>Percentage</u>
Bachelor's degree (only)	56.0
Master's degree	30.4
Doctor's degree	3.8
No degree	9.8
Brought up on farm - wholly	63.6
- partly	3.3
Managed farm	26.6
Business experience	15.1
Teaching experience	45.9
Research experience	6.9
County extension experience	32.3
Other experience	23.7
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ILLINOIS COUNTY LIVESTOCK SCHOOLS

In a series of 64 county schools the past winter, 3,632 Illinois farmers who attended learned how the most successful stockmen make \$900 to \$1,000 extra income a farm from their livestock. These schools were planned by the livestock extension specialist. He taught the schools in 47 counties and other animal husbandmen from the university visited the other 17 counties. Farm advisers in 13 additional counties did this work themselves. These 13 counties are in southern Illinois.

Basing the discussion upon farm records, the program in each county emphasized four factors which increase stockmen's income without increasing livestock production. The leaders explained that the most successful stockmen raise better animals; keep them healthier; sell stock in better market conditions; and sell on higher markets than the farmers getting smaller incomes. Attention also was given to three other factors which decrease the acreage of surplus grain and cheapen stock feeding. The better stockmen have more land in legume crops, and this decreases the grain acreage; they use legumes for pasture and hay so as to supply much of the protein in their rations; and they make efficient use of their horses. The speakers explained that a horse eats the pasturage, hay and grain from about one-tenth as much land as he cultivates, and there is that much crop which does not have to be sold. They said that 15-cent corn when fed to a horse does just as much field work as dollar corn.

Stockmen who attended these county schools told of various instances where substantial increases in income were made in precisely the manner suggested by the speakers. In some of the counties the farm advisers continued the project by holding local schools or by presenting a brief discussion at local meetings. The farm advisers and stockmen who enrolled were given an outline of the discussion for further reference and study.

ILLINOIS COUNTY LIVESTOCK SCHOOLS (Continued)

How the Work Was Done

The extension specialist served principally to instruct the county agents and local leaders in methods of instruction and subject matter. These local people were urged to carry the instruction further by means of community meetings. In some cases considerable progress was made in this way and in others not much was done without his help.

It is found that many of the younger stockmen are very capable of discussing general livestock management and various detailed phases of it at local meetings. In order to do this successfully they need and use the prepared outline. The outline also helps to unify the instruction so that the same recommendations are made to farmers in each part of the county and to farmers in the various counties where conditions are similar.

All the local arrangements for meetings, demonstrations, and tours were entrusted to the county agents and the local leaders. In all cases their arrangements were very satisfactory and seemed to fit local conditions although there was considerable variation in the type of arrangements made.

Some demonstration meetings and county tours were held in cooperation with farm-crops specialists, especially in cases where the use of legume crops was a feature of the event. In connection with the county livestock tours it was suggested that the county agent arrange to have someone present to discuss livestock market conditions and prices. In most cases county agents secured someone from the nearest stock yards to help in this way. The farmers seemed to be very much interested in that part of the program.

The county agents promote the boys' livestock club work, the county fairs, and the farmers' institutes. With the help of the Smith-Hughes high-school agriculture teachers they cooperate with the Animal Husbandry Department to train boys in livestock judging and to bring them to the university to compete in the annual State livestock judging contests. The extension specialist gives assistance to high schools, farmers' institutes, fairs, breed associations, cooperative livestock marketing organizations, and the Illinois Agricultural Association in promoting their projects.

From Annual Report of E.T. Robbins, 1933.

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NEBRASKA PIG CROP CONTEST - 1933

Fifty-three cooperators entered the 1933 Nebraska Standard Pig Crop Contest. This is the smallest number of entrants the contest has had since it was started. This can be attributed, primarily, to the relatively low market price of hogs. Of the 53 entrants, 12 finished the contest. Many circumstances caused this low percentage of those finishing. The most outstanding reasons were the shortage of feed and the emergency pig and sow marketing. Many of the cooperators took advantage of the latter and cashed in on their 1933 spring pigs. Others dropped out because of poor results in saving the pigs during the first two or three weeks. Each year circumstances existing on individual farms keep some entrants from completing the project.

One of the main objects of this project is to encourage the practice of hog-lot sanitation as a preventive measure against the common pig parasites and diseases, other than cholera. By establishing a pig-crop-contest unit in a community, it is always hoped to set up a demonstration under farm conditions which will prove to the neighbors and others that hog production, under sanitary conditions, is a more profitable enterprise than production where sanitation is not followed. Some contestants follow the sanitation program to the letter, others follow in part, while some start but for various reasons turn back to old methods.

Five of the 12 farmers completing produced an average of 1,389.4 pounds of pork per sow. They kept an average of 11.8 sows per farm and raised to a marketable age 7.1 pigs per sow which is two pigs more than the State average.

Summary of 1933 Nebraska Pig-Crop Contest

<u>Item</u>	<u>Average for</u> <u>5 best Farms</u>	<u>Average for</u> <u>all 12 farms</u>
Feed and labor cost per cwt. of all pork produced ..	\$2.32	\$2.37*
Cost per pig.....	4.52	4.09*
Weight of all pigs raised at 6 months of age, lbs...	194.6	165.5
" " " litters produced, lbs.....	1389.4	1105.7
Number of sows per farm.....	11.8	13.1
" " pigs farrowed per sow.....	9.3	9.0
" " " raised per sow.....	7.1	6.6
Percentage of farrowed pigs raised.....	77	74

*Average of 10 farms.

---From Annual Report of W.W.Derrick, 1933.

MISSOURI WORK-STOCK ACTIVITIES

The work-stock program in Missouri is planned to assist in rebuilding the depleted stock of horses and mules with animals of good type. The State Legislature's repeal of the stallion licensing law has made it possible for grade stallions to be used and with only a limited number of good stallions and jacks in the State, it is evident that too many undesirable colts will be raised.

During the year 46 good registered stallions and jacks were bought. Agencies used in 1933 to help improve the horse situation were multiple-hitch demonstrations, plowing contests, bot-treatment demonstrations, 4-H colt clubs, colt shows, and a State-wide horse meeting held at Columbia on February 17.

Extension animal husbandmen assisted with 38 multiple-hitch demonstrations where 1,063 farmers had their attention called to: The advantages of the multiple hitch; control of parasites in horses; feed and management; fitting collars, care of teeth and the importance of breeding only good mares to good stallions or jacks. Twenty-one demonstrations were held by the county agents. In 11 counties 5,866 horses were treated for internal parasites. The county agents have cooperated with the local veterinarians and the extension veterinarian.

Due to the wheat-reduction program only two plowing contests were held, one in Lafayette County by the agent alone and one in Monroe County where the extension specialists assisted. At the Monroe County contest, excellent opportunities were afforded to show: Proper and ill-fitting collars; the advantage of a second check on the lines to control the lead team instead of cross-tying where the horses were not gaited alike; flexibility in the eveners; and proper adjustment of the plow. Most of the 250 people in attendance manifested an unusual interest in the contest and were appreciative of the suggestions made. Following the plowing contest 27 draft colts were exhibited and the same keen interest was shown in the colt show. The outstanding feature of the show was the evidence of the need of better stallions.

At Liberty, on October 7, there was a county show of draft colts with 23 colts shown. The top colts were good. This was the fourth year of the show.

4-H Colt Clubs were organized in Cass, Marion, and Monroe

Counties. The youngsters have done a creditable job for their first attempts to develop colts. One of the Cass County members sold his mule colt for \$75. At their achievement-day round-up program three of the club members put on a multiple-hitch demonstration and did a good job. Some of the members in the Monroe County Club, starting in 1932, put 600-pound gains on their colts in less than a year.

The State-wide horse meeting held at Columbia was arranged for the interest of stallion and jack owners in particular. The Missouri Experiment Station results in developing colts created much interest.

We also prepared a list of available draft stallions and jacks in Missouri and adjoining States and sent it to all the agents. As a result, records indicate that 35 stallions and 11 jacks were brought into the various counties during 1933.

The rapid spread of the use of multiple hitches indicates increased interest in horses and mules as a source of economical and dependable farm power. Three hundred thirteen hitches were reported in use in 1930; 787 in 1931; 2,305 in 1932; and 2,710 in 1933.

--From Missouri Annual Report, 1933.

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MISSISSIPPI PUREBRED SIRE RECORD, 1933

Beef bulls placed-----	197
Boars placed -----	232
Rams placed -----	31
Jacks placed -----	23

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NEW SPECIALIST IN LOUISIANA

C. L. Hill, formerly extension poultryman with the Louisiana Extension Service, has been appointed extension animal husbandman on the same staff, vice G. L. Burleson who has transferred to other duties.

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4-H CLUB DEMONSTRATION OUTLINE

By I. B. Johnson, Field Agent at Large,
South Dakota Extension Service.

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SUBJECT - Location and Use of Wholesale Cuts of a Fat Hog

Jim	Bill
I. (Speaks) Introduction Why this subject was chosen What we plan to demonstrate Why live animal used	I. Stands at attention while introduction is being given and bows when name is mentioned. Arranges hog display crate with side view to audience.
II. Assists by outlining with chalk the wholesale cuts on the fat hog as teammate talks. Points to the parts of the animal as they are referred to by teammate.	II. (Speaks) Enumerates the wholesale cuts of pork, telling where each is located, how made and its percentage of carcass. Shows location of high-quality and low-quality cuts. Explains how names of wholesale cuts differ from names of parts of animal used in hog judging.
III. (Speaks) Explains the utilization of the wholesale cuts: 1. Retail or kitchen cuts 2. Cuts usually cured 3. Cuts used for lard 4. Cuts used for pork specialties	III. Assists by pointing to the various cuts as they are referred to by teammate.
IV. Assists by pointing to the various parts of the hog as they are referred to by teammate.	IV. (Speaks) Explains importance of using well-bred hogs to produce a greater percentage of high-quality cuts. Stresses importance of well-arched back, uniform width of back, deep smooth sides and plump hams.
V. Questions (Speaks) Conclusion	V. Answers questions referred to him by teammate.

References: Extension Circular 315 - Pork on the Farm - S. D. State College, Extension Service, Brookings.
Fresh Pork Chart - National Livestock and Meat Board, 407 S. Dearborn Street, Chicago.

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"DRIVE-IN" RECEIPTS OF LIVESTOCK, 1933

The following table showing the "drive ins" (non-rail receipts) of livestock in 1933 at 17 of the principal markets, also the percentage such receipts were of the total receipts, indicates the extent to which the motor truck, which accounts for about 90 percent of the "drive ins", has become a factor in the transportation of this commodity. Non-rail receipts at all the listed markets made up 48.73 percent of the total receipts, as compared with 40.57 percent in 1932, the highest previous figure.

<u>Market</u>	<u>Number head "drive-ins"</u>	<u>Percentage of total</u>
Omaha	3,568,430	53.96
E. St. Louis.	3,493,476	68.44
Chicago	2,893,002	20.19
Sioux City	2,795,950	70.36
St. Paul.	2,753,335	48.78
Indianapolis.	2,706,933	93.79
Kansas City	2,338,345	42.76
St. Joseph.	2,288,222	66.68
Cincinnati.	1,382,190	67.13
Ft. Worth	1,038,617	54.19
Oklahoma City	953,614	86.99
Wichita	810,002	71.24
Milwaukee	684,253	47.24
Sioux Falls	611,602	95.29
Louisville.	567,239	77.16
Denver	490,573	11.99
Portland.	167,090	31.12

Based on total receipts at the above markets the percentage of each class of livestock listed as "drive-ins" was as follows: Hogs, 61.56 percent; calves, 60.28 percent; cattle, 45.67 percent; and sheep, 25.17 percent.

The Livestock, Meats and Wool Division of the U. S. Bureau of Agricultural Economics has available for distribution in mimeographed form more detailed information on this general subject. If interested write for it.

COLORADO ADDS SPECIALIST

Since last July, George Henderson has been acting as assistant extension animal husbandman to A. C. Allen and has worked primarily in the eastern part of the State where most of the livestock feeding is done.

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MISSOURI BEEF HERD DEMONSTRATIONS

Seventy-eight general meetings were held on beef cattle with an attendance of 5,451. The value of registered beef bulls has been emphasized during the last three years in meetings, circular letters and newspapers. Although the practice of feeding grain to suckling calves has been recommended in communities where sufficient corn was produced, it was also pointed out that the market demanded calves weighing above 650 pounds that were well finished and that April and May calves are too young to get ready for the fall market. Producers were urged to feed out the fall and early winter calves in such a manner that they could be marketed from August until November at a weight of 650 to 800 pounds.

Records kept in previous years on the cost of maintaining the beef cow herd show less cost per head, due to the prevailing feed prices. The feed cost per year for a beef cow for the last nine years was \$22.50; \$22.04; \$19.10; \$21.27; \$19.51; \$23.78; \$20.50; \$17.59, and \$16.50 respectively. The bulk of the feed used to maintain a herd of beef cows in 1933 had little, if any, cash value.

Records of the cost of keeping beef cows and the results from feeding grain to the suckling calves were started in 1924 to secure information that might help to prevent the liquidation of all the good beef cow herds. Conditions have changed and farmers have enlarged their breeding herds on Missouri and other Corn Belt farms. Consequently, farmers are now cautioned about too many beef cows with resultant low prices for fat calves. Although farmers have been warned not to expand in the beef cow business, yet it has been suggested that established herds of good beef cows should not be liquidated from farms well adapted to such an enterprise.

Farmers have been advised to use the best bulls available, select the best heifers of their own raising for replacements, and build better but no larger herds with which to produce commercial beef. An attempt has been made to prevent any further increase in cow numbers on farms and to assist new breeders to get their herds on a paying basis.

Last year's results show that 684 pound calves consumed 22 bushels of corn; 6 bushels of oats; 72 pounds of cottonseed meal; and 220 pounds of hay. Based on 1933 feed prices this would give a feed cost of \$12.30 per calf in addition to the cow's milk. Figuring the keep of the cow at \$16.50, \$4.75 for interest, taxes and depreciation and \$2.00 for bull charge, would make a total cost

per calf of \$35.55. A few of the most efficient producers were able to realize \$6.00 net on these calves but the majority of them did well to get \$5.50 net which means that the practice of grain feeding calves in 1933 didn't enable the operator to realize a profit that he so sorely needed. However, it is true that at \$5.50 a 684 pound calf would break even; we must remember that these figures apply to the best operators and when we consider the average it is evident that a loss resulted.

--From Missouri Annual Report, 1933.

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RECENT PUBLICATIONS

Federal

"Range Sheep Production" by J. M. Cooper - U.S.D.A. Farmers' Bulletin No. 1710.

"Market Classes and Grades of Pork Carcasses and Fresh Pork Cuts" by Davis, McCarthy and Burgess - U.S.D.A. Bureau of Agricultural Economics Circular No. 288.

"Functions and Activities of State Extension Specialists" by T. Roy Reid and M. C. Wilson - U.S.D.A. Extension Service Circular 189.

State

"Vitamin-A Deficiency as Related to Reproduction in Range Cattle" by Hart and Guilbert - California Experiment Station Bulletin No. 560.

"A Study of the cost of Horse and Tractor Power on Illinois Farms" by Johnston and Wills - Illinois Experiment Station Bulletin No. 395.

"Oats as a Feed for Swine" by W. E. Carroll - Illinois Experiment Station Circular 414.

"Home-Made Hog Equipment" by Schwab and Hill - Indiana Extension Service Bulletin No. 199.

"Marketing Kentucky Livestock by Motor Truck" by C. D. Phillips - Kentucky Experiment Station Bulletin No. 344.

"Value of Rice By-Products as Feeds" by C. I. Bray and C. W. Upp - Louisiana Experiment Station Bulletin No. 242.

"Beef Cattle Production in Louisiana" by C. I. Bray - Louisiana Experiment Station Bulletin No. 244.

"An Industrial Alcohol By-Product Stock Food" by Broughton, Frey and Carmichael - Maryland Experiment Station Bulletin No. 349.

"Motor Truck Marketing of Michigan Livestock" by G. N. Motts - Michigan Experiment Station Special Bulletin No. 235.

"Some Causes of Variations in Shrinkage on Livestock" by McNulty and Dvoracek - Minnesota Extension Service, Farm Business Notes No. 117.

"Selection and Purchase of Feeders and Rations for Fattening Beef Cattle" by W. H. Peters - Minnesota Experiment Station Bulletin No. 300.

"Hitching Horses for Better Implement Operation" by Torrance and Harvey - Minnesota Extension Service Special Bulletin No. 162.

"Horses" by Miller and Anderson - Montana Extension Service Bulletin No. 135.

"Lamb Slaughtering, Cutting and Curing - Part 3" by Trowbridge and Severson - North Dakota Experiment Station Circular No. 49.

"Sheep Raising in Ohio" by L. A. Kauffman - Ohio Extension Service Bulletin No. 68.

"Motor Transportation of Livestock in Ohio" by Geo. F. Henning - Ohio Experiment Station Bulletin No. 531.

"Oat Feed as a Substitute for Roughage" by Thomas M. Olson - South Dakota Experiment Station Bulletin No. 281.

"Pastures" by R. H. Bush - Texas Extension Service Bulletin No. 82.

"Seedy Cut Causes Loss in Bacon" by Cole, Park and Deakin - Wisconsin Extension Service Circular 262.

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